

CLAIMS

- 1) A process for production of a mash having enhanced filterability and/or improved extract yield after filtration, which comprises; preparing a mash in the presence of enzyme activities and filtering the mash to obtain a wort, wherein the enzyme activities comprise; a xylanase of GH family 10 present in an amount of at least 15% w/w of the total xylanase and endoglucanase enzyme protein of said composition.
- 2) The process of the preceding claim wherein endoglucanase is present, said endoglucanase belonging to a GH family selected from the list consisting of; GH12, GH7 and GH5.
- 3) The process any of the preceding claims wherein the endoglucanase activity belonging to GH family GH12, GH7 and/or GH5 is present in an amount of at least 40% w/w of the total xylanase and endoglucanase enzyme protein of said composition.
- 4) The process any of the preceding claims wherein the xylanase of GH family 10 is present in an amount of at least 20%, preferably 25%, such as at least 30%, at least 35%, at least 40%, at least 45%, at least 50%, at least 60%, or even at least 70% w/w of the total xylanase and endoglucanase enzyme protein
- 5) The process any of the preceding claims wherein the endoglucanase of GH Family 12, 7 and/or 5 endoglucanase is present in an amount of at least 45%, preferably 50%, such as at least 55%, at least 60%, at least 70% or even at least 80% w/w of the total xylanase and endoglucanase enzyme protein.
- 6) The process any of the preceding claims wherein the xylanase is a type A xylanase.
- 7) The process any of the preceding claims wherein the xylanase is a type A xylanase having a $I_{1,3\text{terminal}}/I_{1,3\text{internal}}$ ratio of at least 0.25, such as at least 0.30, at least 0.40, at least 0.50, or even at least 0.60.
- 8) The process any of the preceding claims wherein the xylanase has a CBM, preferably

a CBM of family 1.

9) The process any of the preceding claims wherein the xylanase is a xylanase which in the xylanase binding assay described herein has a barley soluble/insoluble fibre binding ratio of at least 0.50, preferably at least 0.60, more preferably at least 0.70, such as 0.80, 0.90, 1.00, 1.10 or even at least 1.20.

10) The process any of the proceeding claims wherein the xylanase is

a) a xylanase derived from a filamentous fungi such as from a strain of an *Aspergillus* sp., preferably from *Aspergillus aculeatus* (SEQ ID NO:8 or SEQ ID NO:9), from a strain of a *Myceliophthora* sp., preferably from a *Myceliophthora thermophila* (SEQ ID NO:13), from a strain of a *Humicola* sp., preferably from *Humicola insolens* (SEQ ID NO:12), or from a strain of *Trichoderma* sp., preferably from *T. reesei* (SEQ ID NO:17).

b) an xylanase having at least 50%, such as at least 60%, 70%, 80% or even 90% homology to any of the sequences in a).

11) The process any of the preceding claims wherein the xylanase is derived from a bacterium such as from a strain of a *Bacillus*, preferably from *Bacillus halodurans*.

12) The process any of the preceding claims wherein the endoglucanase is;

a) an endoglucanase derived from *Humicola* sp., such as the endoglucanase from *Humicola insolens* (SEQ ID NO:3), or the endoglucanase from *H. insolens* (SEQ ID NO:4), from *Thermoascus* sp., such as the endoglucanase derived from *Thermoascus aurantiacus* (SEQ ID NO:6) or from *Aspergillus* sp., such as the endoglucanase derived from *Aspergillus aculeatus* (SEQ ID NO:16) or from *Trichoderma* sp., such as the endoglucanase from *T. reesei* shown in SEQ ID NO:18, the endoglucanase from *T. viride* sp. shown in SEQ ID NO:19 or the endoglucanase from *T. reesei* shown in SEQ ID NO:20.

b) an endoglucanase having at least 50%, such as at least 60%, 70%, 80% or even 90% homology to any of the sequences in a).

13) The process any of the preceding claims wherein at least one additional enzyme is present, which enzyme is selected from the list comprising; arabinofuranosidase, ferulic acid esterase and xylan acetyl esterase.

5 14) A process of reducing the viscosity of an aqueous solution comprising a starch hydrolysate, said process comprising:

- a. testing at least one xylanolytic enzyme for its hydrolytic activity towards insoluble wheat arabinoxylan,
- 10 b. selecting a xylanolytic enzyme which cleaves next to branched residues thereby leaving terminal substituted xylose oligosaccharides.
- c. adding the selected xylanolytic enzyme to the aqueous solution comprising a starch hydrolysate.

15 15) A process of reducing the viscosity of an aqueous solution comprising a starch hydrolysate, said process comprising:

- d. testing at least one endoglucanolytic enzyme for its hydrolytic activity towards barley beta-glucan,
- 20 e. selecting a endoglucanolytic enzyme which under the conditions: 10 microgram/ml purified enzyme and 5 mg/ml barley beta-glucan in 50 mM sodium acetate, 0.01% Triton X-100, at pH 5.5 and 50°C, within 1 hour degrades more than 70% of the barley beta-glucan to DP 6 or DP<6,
- f. adding the selected endoglucanolytic enzyme to the aqueous solution comprising
25 a starch hydrolysate.

16) The process any of the preceding claims, wherein the aqueous solution comprising a starch hydrolysate is a mash for beer making or a feed composition

30 17) A composition comprising;

- g. a GH10 xylanase present in an amount of at least **15%** w/w of the total enzyme protein; and/or,
- h. a GH12, GH7 and/or GH5 endoglucanase present in an amount of at least **20%** w/w of the total enzyme protein.

18) The composition according to the preceding claim wherein the xylanase is a type A xylanase, and preferably a type A xylanase having a $I_{1,3\text{terminal}}/I_{1,3\text{internal}}$ ratio of at least 0.25, such as at least 0.30, at least 0.40, at least 0.50, or even at least 0.60.

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19) The composition according to the preceding claims wherein the xylanase is derived from a filamentous fungi such as from a strain of an *Aspergillus* sp., preferably from *Aspergillus aculeatus* (SEQ ID NO:8 or SEQ ID NO:9), from a strain of a *Myceliophthora* sp., preferably from a *Myceliophthora thermophila* (SEQ ID NO:13),
10 from a strain of a *Humicola* sp., preferably from *Humicola insolens* (SEQ ID NO:12).

20) The composition according to the preceding claims wherein the xylanase is derived from a bacterium such as from a strain of a *Bacillus*, preferably from *Bacillus halodurans*.

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21) The composition according to the preceding claims wherein the endoglucanase is endoglucanase derived from *Humicola* sp., such as the endoglucanase from *Humicola insolens* (SEQ ID NO:3), or the endoglucanase from *H. insolens* (SEQ ID NO:4), from *Thermoascus* sp., such as the endoglucanase derived from
20 *Thermoascus aurantiacus* (SEQ ID NO:6), or from *Aspergillus* sp., such as the endoglucanase derived from *Aspergillus aculeatus* (SEQ ID NO:16).

22) The composition according to the preceding claims wherein the xylanase of GH family 10 is present in an amount of at least 20%, preferably 25%, such as at least
25 30%, at least 35%, at least 40%, at least 45%, at least 50%, at least 60%, or even at least 70% w/w of the total xylanase and endoglucanase enzyme protein

23) The composition according to the preceding claims wherein the endoglucanase of GH Family 12, 7 and/or 5 endoglucanase is present in an amount of at least 45%,
30 preferably 50%, such as at least 55%, at least 60%, at least 70% or even at least 80% w/w of the total xylanase and endoglucanase enzyme protein.

24) Use of a composition according to the preceding claims in a process comprising reducing the viscosity of an aqueous solution comprising a starch hydrolysate.

25) Use of a composition according to the preceding claims in a process comprising filtering of an aqueous solution comprising a starch hydrolysate.

5 26) Use of a composition according to the preceding claims in a process wherein the aqueous solution comprising a starch hydrolysate is a mash for beer making.

27) Use of a composition according to the preceding claims in a process wherein the aqueous solution comprising a starch hydrolysate is a feed composition.

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